Some Problems in Research Management

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I AM indeed happy to receive your Honor Scroll Award. In accepting the award I share it with all members of the staff of the Eastern Regional Research Laboratory. I have had the great good fortune of being associated with a fine group of people who have made my task an easy one and in every sense they share this honor with me.

For nearly fourteen years I have had the title of Director at our Research establishment in Wyndmoor. Now all of you know that this term "Director of Research" is used to denote the positions of many thousands of scientific administrators. Reference to any directory of research institutions reveals that this term is in very wide use, and many of us so designated have no doubt been pardonably proud of the title. That this title is an astounding contraction of terms, however, will be evident on proper reflection. No one ever *really directs* research *in the normal sense of the word;* it simply can't be done that way. How does it happen, then, that we see all about us a great deal of successful research in all fields of science? I should like to discuss this matter briefly, because it is something that through the years has become an important part of my conviction as to how all of us who have such responsibility must act in managing institutional research.

Most of our scientific research today is conducted in institutions which are organized for the express purpose of carrying out investigations which require organized effort to fulfil their function. The nature of these programs is dictated by the nature of the company business, or what it hopes to make its business. In the case of Government research, the programs are authorized and circumscribed by laws which direct the research into specified fields. In either case we generally are confronted with the same broad boundaries within which we proceed to our ultimate objectives. The most difficult of all problems in managing such research is to reconcile the demands of organized effort with the freedom of the individual to pursue his chosen line of inquiry. Productive research requires a great deal of latitude in the

choice of problem and manner of approach. At the same time the total organized effort demands some restriction of direction in the interest of gaining the specified goals, whether these be established by company boards of directors, by Acts of Congress, or by any determinant group which has the responsibility of footing the bills.

Guideposts for Government Research

My experience has been confined to research in the Department of Agriculture, where many varied types of investigations are conducted. These studies are authorized by the Congress under broad statutes which set forth the objectives. They tell us what the investigations are expected to accomplish and, by so doing, they restrict the field of activity. Various research agencies of the Department find their specific missions stipulated in the different sections of the broad statute authorization. These further restrict the scope of work assigned to the research branches, and hence they narrow the field of the individual investigator. The important point to consider here, however, is that although the Congress specifies in broad terms *what* we should do, it does not tell us *how* we should do it. Within the broad Congressional authorization there is always sufficient latitude for the agency and for the scientist to exercise the degree of freedom necessary for good research. These legal restrictions, then, do not have a stifling effect; they serve as valuable guideposts which steer the investigators on a given course.

The Congress also imposes one other restriction through annual appropriations which establish *how much* can be done. Progress is reviewed each year in connection with these appropriations. Just as company boards of directors expect prudent management, wide-awake diligence, initiative and reasonable progress, so do our Congressional committees on appropriations. But here again decisions as to how the program goals are to be reached are properly left to the judgment of scientific administrators. One often hears the complaint among Government research administrators — and I suspect this would also be true in many areas of industrial research — that it is impossible to get support for fundamental research even though such work is specifically included in our broad research authorizations. The answer to that apparent dilemma is, I think, a very simple one. If fundamental work is required to provide the background of information necessary to reach the goals established for us, it is up to us as administrators to assemble scientific personnel capable of doing that kind of work and proceed with our task. Since the Congress does not specify how, it is our clear responsibility to make this determination. The goals themselves provide the justification; it is not necessary to justify the method of approach.

The Conditions Which Bring Success

Now what does all this mean to the research administrator in managing his program? It is apparent that within the framework of broadly stated goals or objectives it is his problem to establish the conditions which will lead to success. I am certain that no one person has all the answers for this kind of situation, but let us consider some of the things that may play a decisive role in the success or failure of his efforts.

The old adage — "A man may well bring a horse to the water, but he cannot make him drinke without he will" — is never more forcefully demonstrated than in this field of human endeavor. *You can lead in research, but you cannot direct it.* This concept stems directly and simply from the very nature of research itself. It is a thing of the mind and of the spirit. It can be nurtured, but not forced. It is a quest for new knowledge, no matter what the motive. It is creative. It must be done in a proper atmosphere — an atmosphere of freedom.

I suppose there are many ways that research can be managed to achieve success. Certainly all of the successful research is not being supervised or carried out in the same fashion. The personal qualities, backgrounds and inclinations of our research leaders are of the most varied sort. Yet somewhere there must be certain essential qualities that are common to all who find success in this field.

First of all, I think, is the recognition that research is done by persons who as individuals have the same aims, ambitions and hopes of all people. It is therefore imperative that research managers understand people, and this is in no sense a peculiar requirement; it is a common quality needed for leadership in any field. But a primary requirement, and one not too well understood or appreciated, is that *to understand people you have to like people.* A study of the principles of psychology is undoubtedly an enormous aid in understanding human reactions, but even a lifetime of such study would be inadequate to overcome the handicap of simply not liking people. It is obvious that such a person would fail, not only in research leadership, but in any other similar capacity in any field.

Granted that one does like and does understand people, and has adequate competency in his science and specialized field. What else? Given a competent staff and well understood objectives, what can he do to insure success? In this situation a lazy administrator would probably do quite well. Since I am saying this in all

seriousness, this statement requires some explanation. The lazy person would tend not to bother the man in the laboratory, but leave him to his own devices. Disregarding the reason for so doing, most of you will recognize that this would, in general, be a desirable course of action. Now, I do not advocate this do-nothing business, but it is no worse than to over-supervise or over-administer the research. Over-administration, I may say, represents a needless waste of energy since it is bound to fail. More serious, however, are the mental barriers which it may establish and the stifling effect it can have on individual initiative. Research administrators must recognize and keep in mind that progress in research is determined to a large extent by the man in the laboratory and by his mental capacity and attitude. If we impair or hinder individual initiative through over-supervision we will eventually drive our ship on to a barren shore.

Freedom in research is of the utmost importance and perhaps is the most difficult of all to achieve. It is also the least understood, particularly by the individual scientist. Graduation at any level from the best of our accredited educational institutions affords no guarantee that the individual will be capable of independent study. Only after he has had an opportunity to participate in an actual research project can his ability be determined. His situation is somewhat analogous to the trained but untried soldier. Only actual combat can establish his capacity to participate in battle. Similarly, the research man must demonstrate his mettle before he can be turned loose to work on his own initiative. To do so before an adequate trial period might well be disastrous for the individual, since, if he fails, it may take years to re-establish his lost confidence. Research independence is thus obviously not a right, but something to be earned. If this principle were better understood it would save the research supervisor a great many headaches.

The major problem, then, of any research supervisor is to avoid a system of arbitrary direction. He must establish instead not only the kind of conditions which are conducive to good research, but also to bring about in his associates an ever increasing ability to work independently and to exercise the freedom of mind so essential to creative work.

We speak of desirability of fostering and developing the proper atmosphere for research — a creative atmosphere, if you will. Just what is this elusive quality that should characterize every good research group, and how do you go about achieving it? It is a thing unreal, and yet at once apparent when there. It defies definition in any formal sense, yet in its presence the meaning becomes crystal clear. Optimism and hope in the face of repeated failure; faith that ignorance must always yield to truth; confidence in the power of objective reason. These are a few of the symbols. Like research itself they are things of the mind and of the spirit, and they can only be cultivated with kindred tools. We research administrators and supervisors can do most by expecting the best — a proper professional attitude, unselfishness, objectiveness, determination, diligence, and an uncompromising zeal for the truth. We can also do some other things; we must see that the right person is on the right job; we must see that achievement is recognized, we must encourage and suggest, we must provide a proper degree of freedom, and last, but not the least, we must have a patient faith that the efforts of our colleagues will succeed.

P. A. Wells—Director and Manager of Research

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(Presented when Dr. Wells received the Honor Scroll of the AIC Pennsylvania Chapter.)

THE complimentary things I will say about P. A. Wells are said every day by someone around the Eastern Lab. I have often wanted a chance to say publicly what I and the rest of our staff think about our director. He is a friend of everybody. He is sincerely respected and admired and liked. We take to him our troubles and our triumphs. We make requests. He loves to say yes to them, but if it has to be no, he will patiently explain why, and the requester goes away satisfied. Often he has to make requests of us — sometimes irksome and bothersome things, as in any one's day's work. He does so almost apologetically. He is really loath to bother us. He likes to leave us alone. It is inconceivable that he would call in Jim Smith and say, "Dr. Smith, Washington wants so and so prepared by a week from now. Let me have it by tomorrow afternoon. And they want it complete and they want it better prepared than the last time. Drop everything and do it". No, Wells doesn't direct us that way. He would say, "Jim, remember that so and so report we prepared last year? Well, Washington wants it again and they want it a week from today. Do you suppose you can sandwich it in and get it ready in four or five days? Might make it a little longer than last year's. You have it all at your fingertips anyway." That's the way he directs and manages.